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PROMISING FORAGE SPECIES AND SEASONS FOR RESEEDING NORTHEASTERN WASHINGTON SCABLANDS

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Channeled-scablands are characteristic of approximately one-half of the 1.5 million acres of land in Lincoln County and of somewhat smaller portions of the 1.4 million and 1.1 million acres in Whitman and Spokane Counties of northeastern Washington. Loss of much loessial surface soil by washing and blowing has exposed underlying basalt and reduced the productivity of this land. Intermingled patches of exposed basalt and erosion pavement and small remnant mounds of soil 12 to 18 inches deep, locally called "biscuits," constitute the true "scab" areas. Of the three recognized soil situations in this area, only the marginal soils lying between the true scablands and the fertile wheatlands offer reseeding possibilities. Past grazing and cropping practices have left only a vestige of the climax vegetation. These relicts are associated with inferior weed species, low-value annual grasses, and browse species over large acreages. Although of lower fertility than the wheatlands, much of the marginal land area appears capable of greater herbage production.

To determine the possibilities of increasing forage production on these marginal soils through reseeding, the Northern Rocky Mountain Forest and Range Experiment Station, in cooperation with Herbert Armstrong, a local rancher, the Harrington Soil Conservation District, and the Washington Agricultural Experiment Station, has been conducting season-of-planting and species adaptability tests since early 1950 in Lincoln County. Although further tests are needed, results to date provide preliminary guides to the successful rehabilitation of these lands by artificial reseeding.

DESCRIPTION OF THE AREA

The study area is located near Harrington, Washington, at an elevation of 2,200 feet on the marginal soil type described. The soil has been classified as a Hesseltine loam (1).[2/] The surface layer is a brown loam extending to a depth of about 6 inches. This is underlain by 3 to 5 feet of rocky, loam subsoil. Beneath the subsoil is the basaltic bedrock. Lack of organic matter and excessive drainage discourage farming of this soil. The area has been

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1/ Acknowledgment is made to Grant A. Harris who initiated this study.
2/ Numbers in parentheses refer to Literature Cited.

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plowed, cropped for several years, and abandoned. Big sagebrush, cheatgrass, needleandthread grass, Sandberg bluegrass, plantain, and sedge had reinvaded in varying amounts after abandonment. Annual precipitation in this locality approximates 11½ inches, about half of which occurs during the winter months, November through February.

THE STUDY

One plot of each of several species and strains was planted on each of three dates in 1950, spring and early and late fall. Each plot contained three rows 18 feet long, spaced 2 feet apart. Soil preparation consisted of plowing, disking, and harrowing. All planting was done with a Planet Jr. seeder. Competing weeds were removed by hand on two different dates during the growing season. Vigor and distribution of plants in the rows of each species were observed beginning with seedling emergence and continuing at intervals until growth was complete. Fall regrowth was observed in the same manner. The plantings and observations were repeated in 1951. These observations are the basis for this research note.

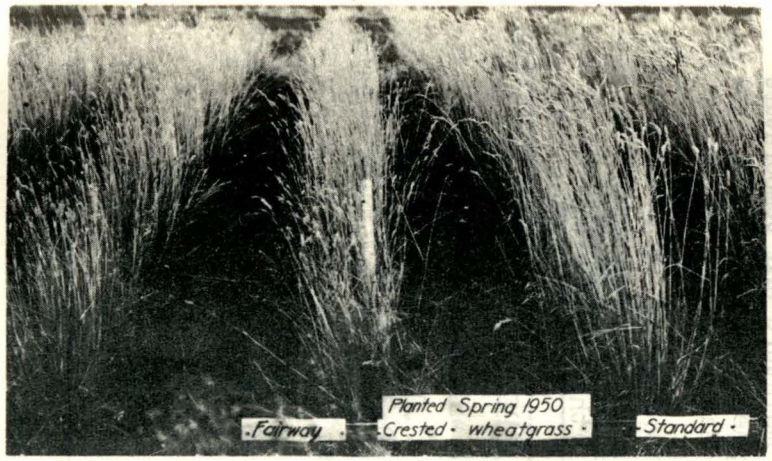
RESULTS

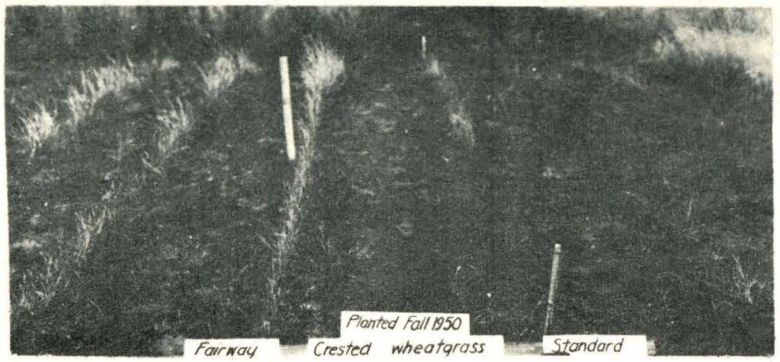
Planting Seasons

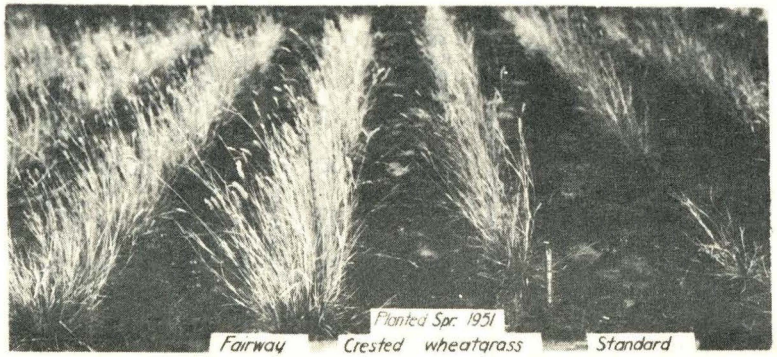
The 1950 spring plantings produced better stands than either the early or late fall plantings in 1950. Spring plantings in 1951 were also highly successful. Of all the species planted in the spring of 1950, 17 produced excellent stands, 6 produced somewhat less satisfactory stands, 12 were considered unsatisfactory, and 4 failed completely (table 1). Similarly, very good stands of vigorous plants were obtained from 18 of the 21 species planted in the spring of 1951. Of the 25 species planted in early fall 1950, 6 species produced very thin stands of plants in poor vigor, 8 were near failures, and 11 failed completely. Of 20 species planted in late fall 1950, 8 produced poor stands, 7 were near failures, and the remaining 5 failed. Crested wheatgrass produced the best stand of all species planted in the fall. Figure 1 shows typical crested wheatgrass stands resulting from spring and fall plantings.

Table 1. Stands of forage plants obtained from spring, early fall, and late fall plantings

Stand rating	Spring		Early fall	Late fall
	1950	1951	1950	1950
Excellent	17	18		
Very good				
Good	6	3		
Poor			6	8
Very poor	12		8	7
Failure	4		11	5
Total number tested	39	21	25	20







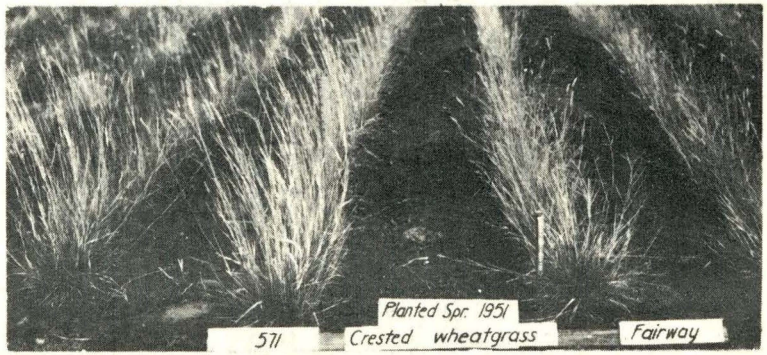


Figure 1. Crested wheatgrass stands from spring and fall plantings. (Variety 571 developed by B.P.I.S.A.E. at Northern Great Plains Field Station, Mandan, North Dakota. Photos taken November 1951.)

Weather conditions more than likely contributed to the relative success of these plantings. U. S. Weather Bureau records taken near Harrington indicate that moisture relations were favorable for the spring seedings (table 2). Although precipitation in the spring of 1951 was slightly below normal, cumulative precipitation from the previous fall and winter was adequate for seedling establishment. The fall plantings were favored with abundant precipitation and favorable temperatures which undoubtedly induced germination and seedling emergence before winter. However, in January 1951 below freezing temperature, ranging from -2° to 31°, was recorded on 28 different days. Widespread failures of winter wheat plantings near the study area were attributed to winterkill during the winter of 1950-1951. Other workers (2, 3) have shown that many grass species are extremely sensitive to moisture and temperature limitations in the early stages of seedling development. Little or no snow cover combined with low temperatures is thought to have contributed to the failure of these fall plantings.

Table 2. Monthly precipitation and departure from normal, in inches, at two stations near the study area

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1949 1/												
Ppt.								0.00	0.58	0.98	1.81	0.25
Dep.								-0.33	-0.15	0.05	0.26	-1.51
1950 1/												
Ppt.	2.69	1.48	2.41	0.76	0.70	2.35	0.62	0.09	0.17	3.69	1.47	1.47
Dep.	1.30	0.33	1.57	-0.03	-0.02	1.27	0.36	-0.24	-0.56	2.76	-0.08	-0.29
1951 2/												
Ppt.	1.47	1.00	0.98	0.58	0.40	0.85	0.65	0.65				
Dep.	0.08	-0.15	0.14	-0.21	-0.32	-0.23	0.39	0.32				

1/ Records from station 5 miles south.
2/ Records from station 1 mile north.

Promising Forage Plants

Several forage species used in these tests showed rather strong indications of adaptability to soil and prevailing weather conditions in the study area. However, adaptability cannot be fully appraised in 1 or 2 years, particularly when conditions are more favorable than usual. Therefore, the following groupings of species, based on 1950 and 1951 spring plantings, as to apparent adaptability may have to be revised when more data become available. Good vigor and uniform distribution of plants in the rows were the criteria used to evaluate adaptability. Standard and Fairway crested, tall, intermediate, streambank, bluestem, Siberian, Primar slender, and stiffhair wheatgrasses; Manchar smooth brome; mountain rye; tall fescue; small burnet; sicle and Ladak alfalfa were outstanding in both the 1950 and 1951 spring plantings.

Beardless wheatgrass, commercial slender wheatgrass, Bromar and common mountain brome, Russian wild-rye, sheep fescue, and hard fescue produced less satisfactory stands but the plants were equally thrifty. Good first-year stands of thrifty orchardgrass and timothy plants thinned out to unsatisfactory stands in the second growing season. Good first-year stands of other species were maintained or improved by the second year.

Poor stands were produced by Idaho fescue, a strain of sheep fescue, Indian ricegrass, several species of bluegrass, superior Reed canary grass, green needlegrass, and sickle milkvetch. Although good emergence was obtained with these species, only a few plants in poor vigor became established. Poor emergence and eventual failures were experienced with bulbous, Canby, and Canada bluegrasses and big trefoil.

SUMMARY

Tests of about 30 forage species and strains have been conducted since early 1950 near Harrington, Washington, to determine the best season for planting and the relative adaptability of the species for range reseeding in the channeled-scablands area. Several wheatgrasses, Manchar smooth brome, mountain rye, sickle and Ladak alfalfa produced excellent stands of thrifty plants from spring plantings. Several other species produced satisfactory stands. Crested wheatgrass was the only species that showed promise in the fall plantings.

Although the tests are being continued, results obtained to date strongly indicate that channeled-scabland range areas can be successfully reseeded to any one of several forage species by planting in the spring on a clean, firm seedbed.

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